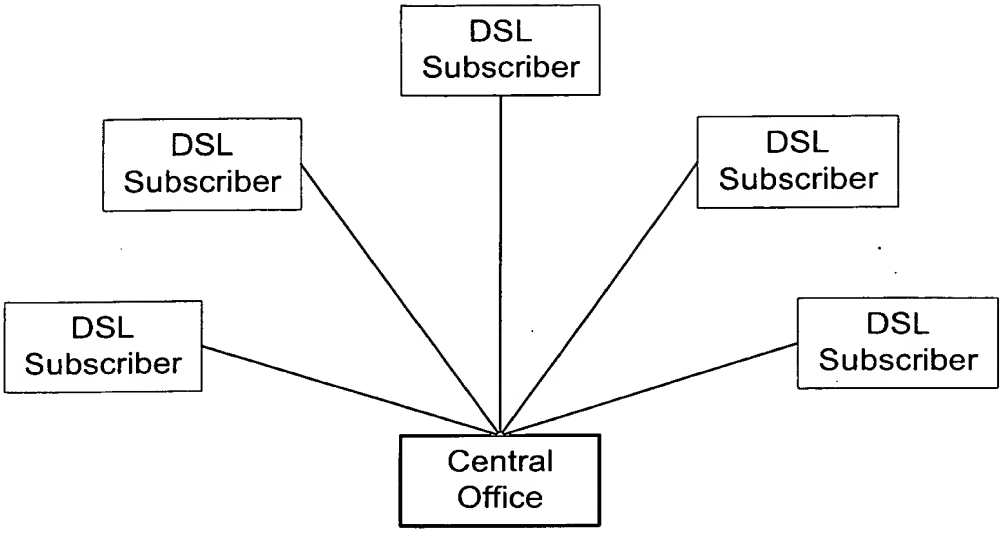
DSL Subscriber
DSL Subscriber
DSL Subscriber
DSL Subscriber
DSL Subscriber
Central Office

Fig. 1

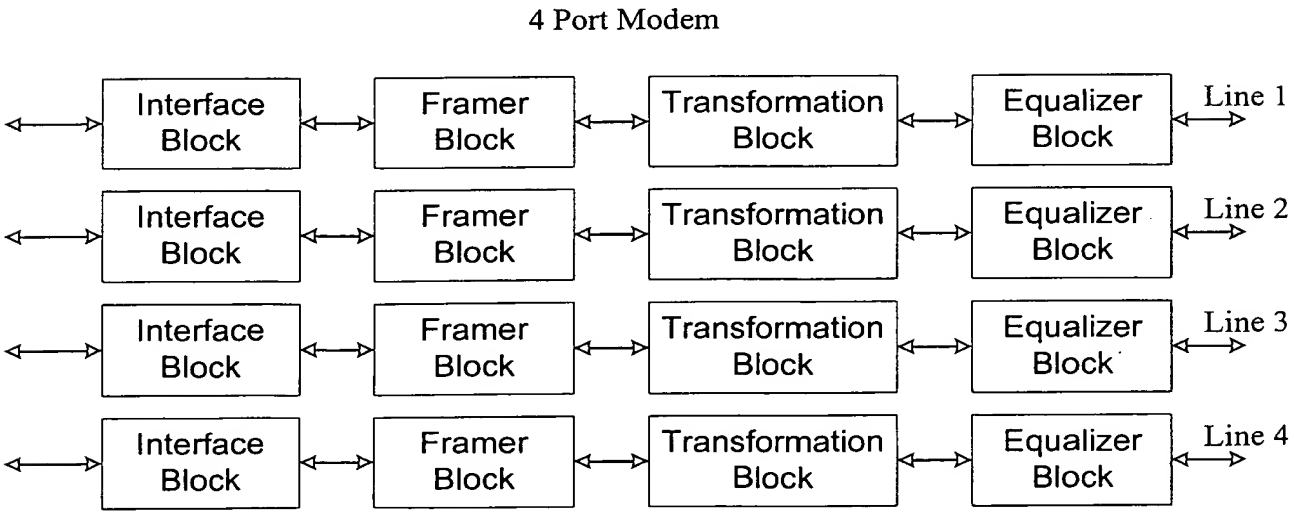
4 Port Modem
Interface Block
Framer Block
Transformation Block
Equalizer Block
Line 1
Line 2
Line 3
Line 4

Fig. 2

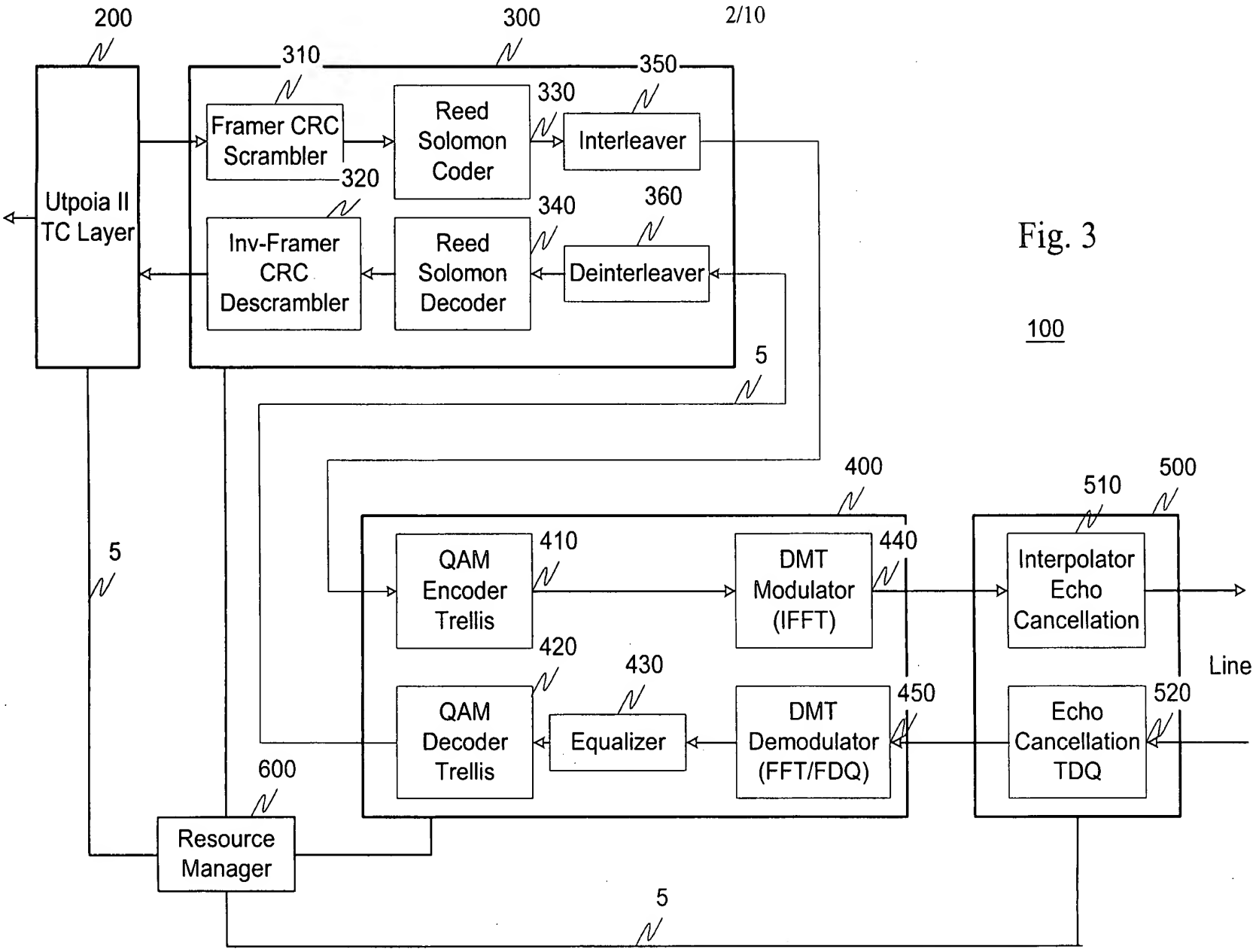
200
300
2/10
310
350
330
Framer CRC Scrambler
Reed Solomon Coder
Interleaver
320
340
360
Utpoia II TC Layer
Inv-Framer CRC Descrambler
Reed Solomon Decoder
Deinterleaver
5
400
500
510
410
440
QAM Encoder Trellis
DMT Modulator (IFFT)
Interpolator Echo Cancellation
5
420
430
450
520
Line
QAM Decoder Trellis
Equalizer
DMT Demodulator (FFT/FDQ)
Echo Cancellation TDQ
600
Resource Manager
5

Fig. 3

100

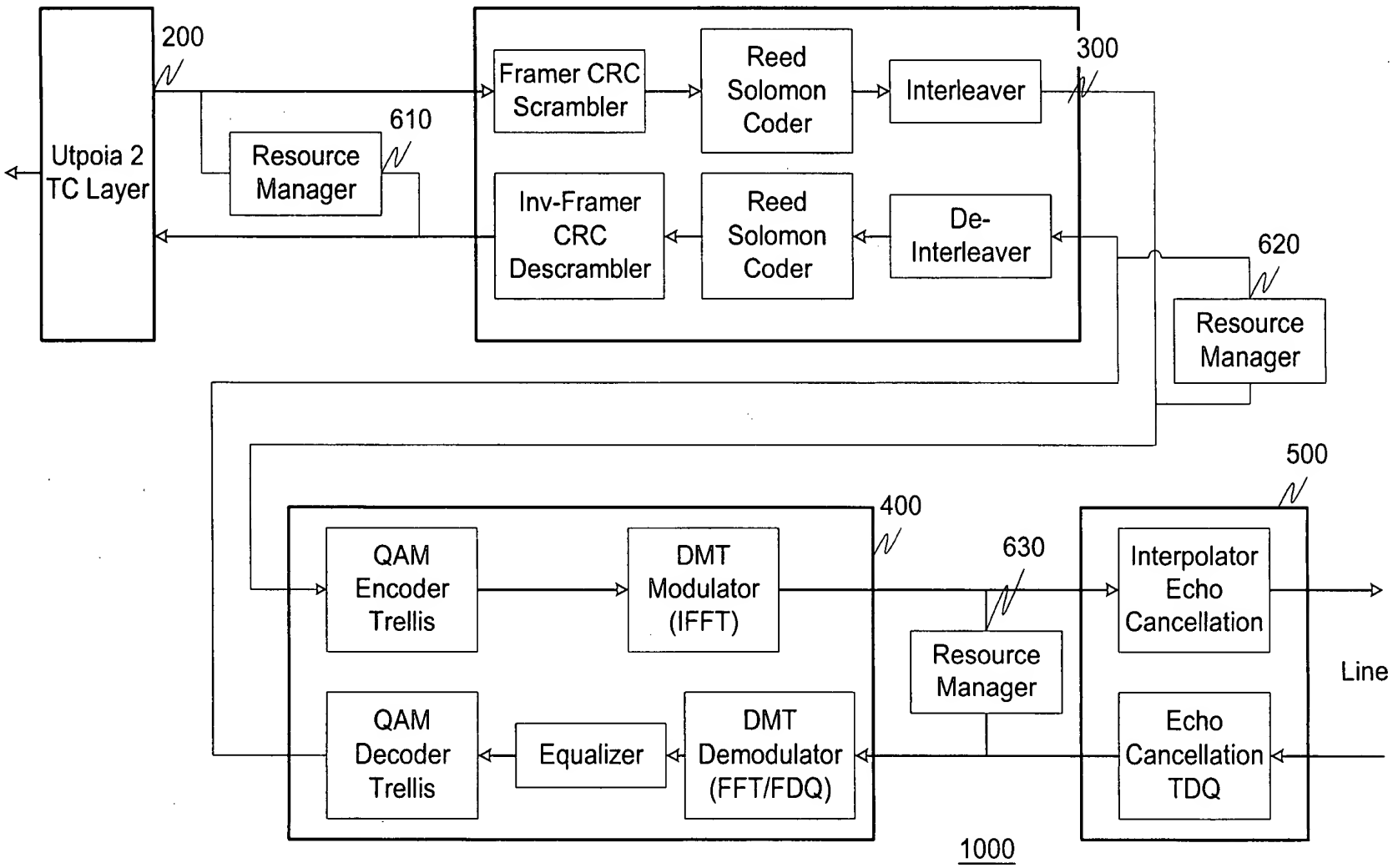
200
Utpoia 2
TC Layer
610
Resource
Manager
Framer CRC
Scrambler
Reed
Solomon
Coder
Interleaver
300
Inv-Framer
CRC
Descrambler
Reed
Solomon
Coder
De-
Interleaver
620
Resource
Manager
500
400
QAM
Encoder
Trellis
DMT
Modulator
(IFFT)
630
Interpolator
Echo
Cancellation
Resource
Manager
Line
QAM
Decoder
Trellis
Equalizer
DMT
Demodulator
(FFT/FDQ)
Echo
Cancellation
TDQ
1000

Fig. 4

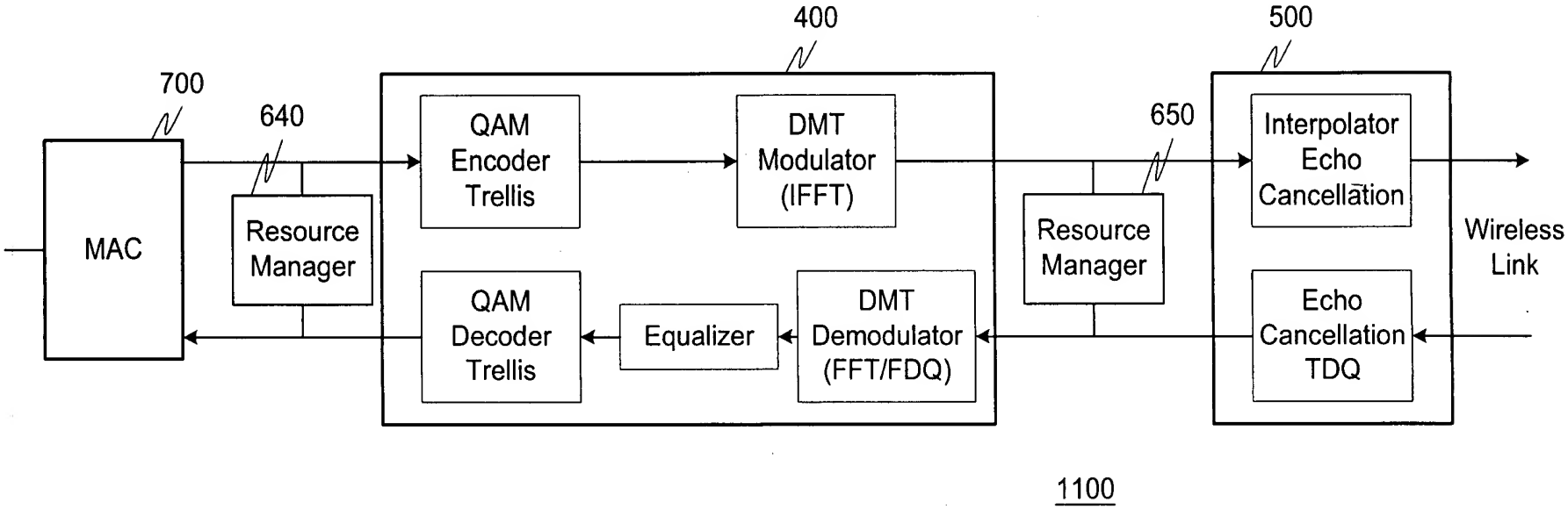
400
500
700
640
650
MAC
Resource Manager
QAM Encoder Trellis
DMT Modulator (IFFT)
Resource Manager
Interpolator Echo Cancellation
Wireless Link
QAM Decoder Trellis
Equalizer
DMT Demodulator (FFT/FDQ)
Echo Cancellation TDQ
1100

Fig. 5

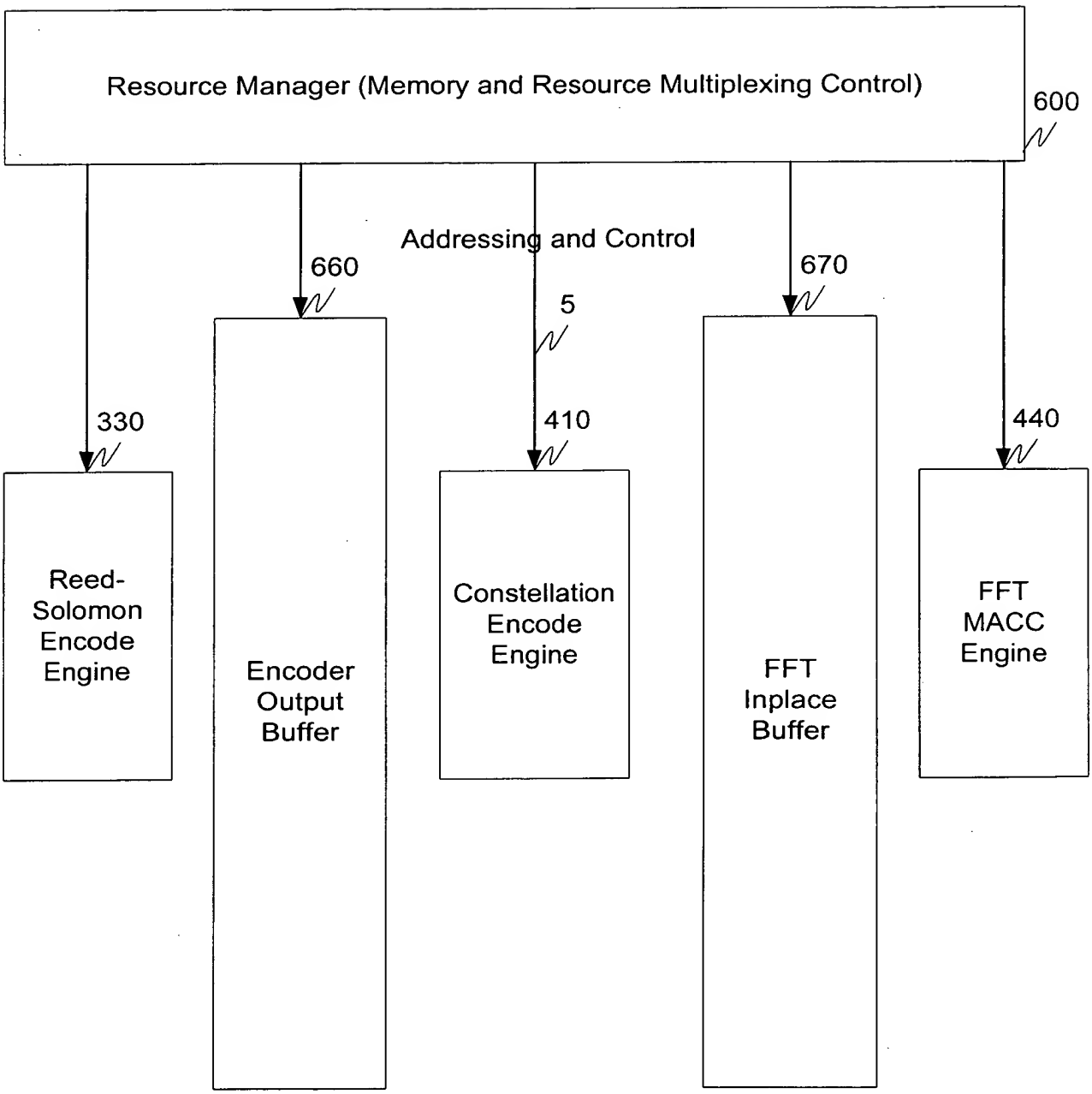
Resource Manager (Memory and Resource Multiplexing Control)
600
Addressing and Control
660
5
670
330
410
440
Reed-Solomon Encode Engine
Encoder Output Buffer
Constellation Encode Engine
FFT Inplace Buffer
FFT MACC Engine

Fig. 6

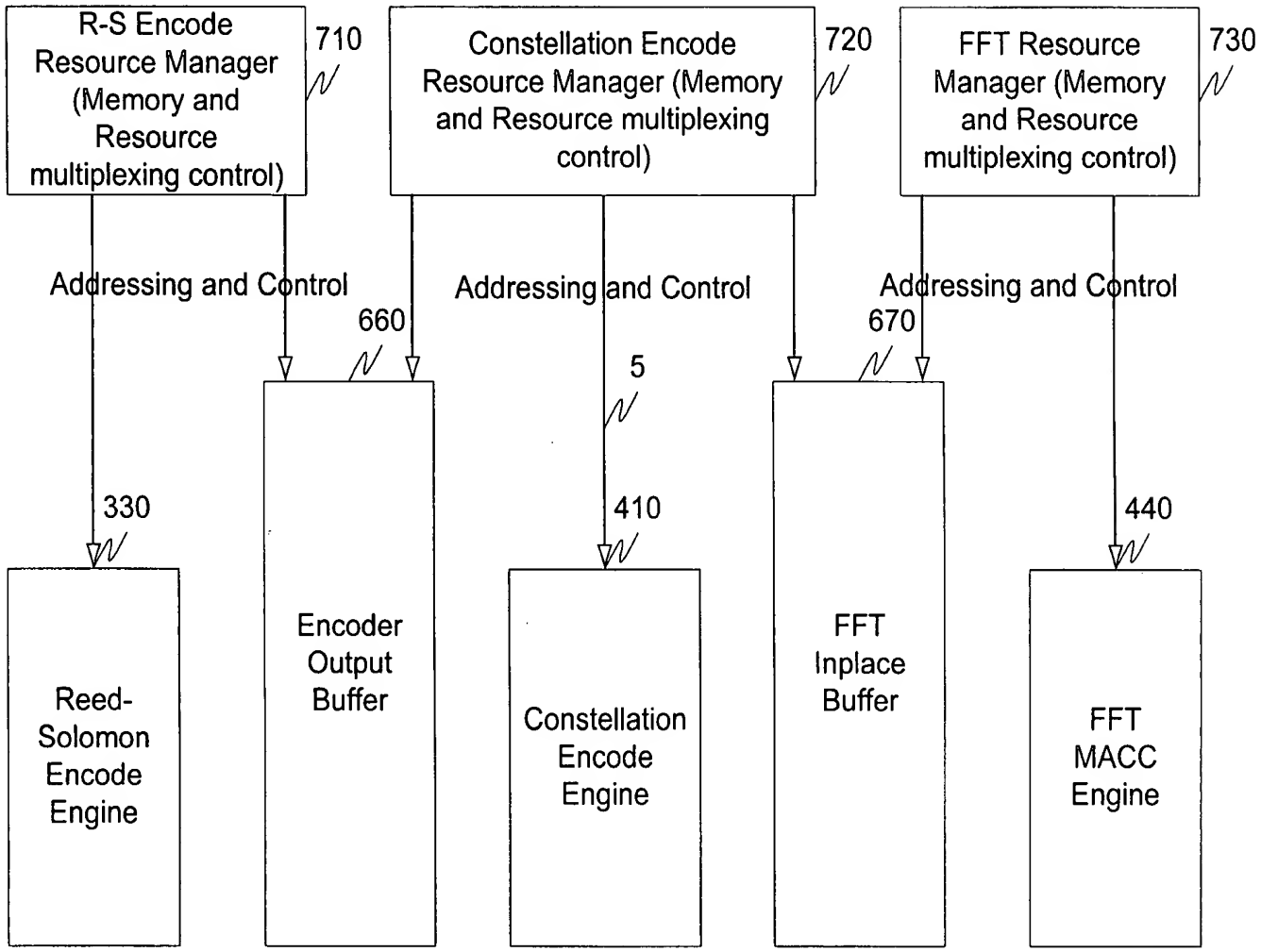
R-S Encode Resource Manager (Memory and Resource multiplexing control)
710
Constellation Encode Resource Manager (Memory and Resource multiplexing control)
720
FFT Resource Manager (Memory and Resource multiplexing control)
730
Addressing and Control
660
Addressing and Control
5
Addressing and Control
670
330
410
440
Reed-Solomon Encode Engine
Encoder Output Buffer
Constellation Encode Engine
FFT Inplace Buffer
FFT MACC Engine
700

Fig. 7

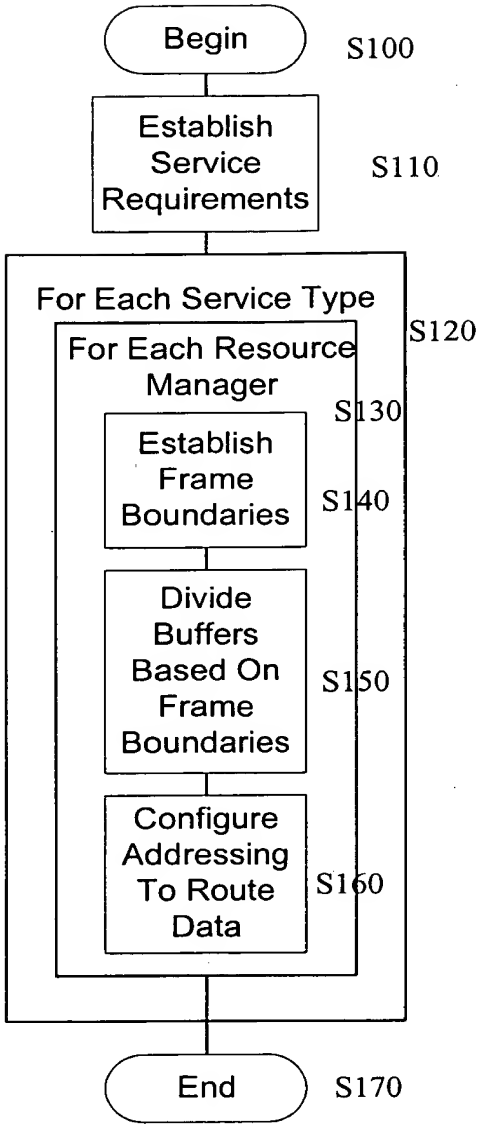
Begin
S100
Establish Service Requirements
S110
For Each Service Type
S120
For Each Resource Manager
S130
Establish Frame Boundaries
S140
Divide Buffers Based On Frame Boundaries
S150
Configure Addressing To Route Data
S160
End
S170

Fig. 8

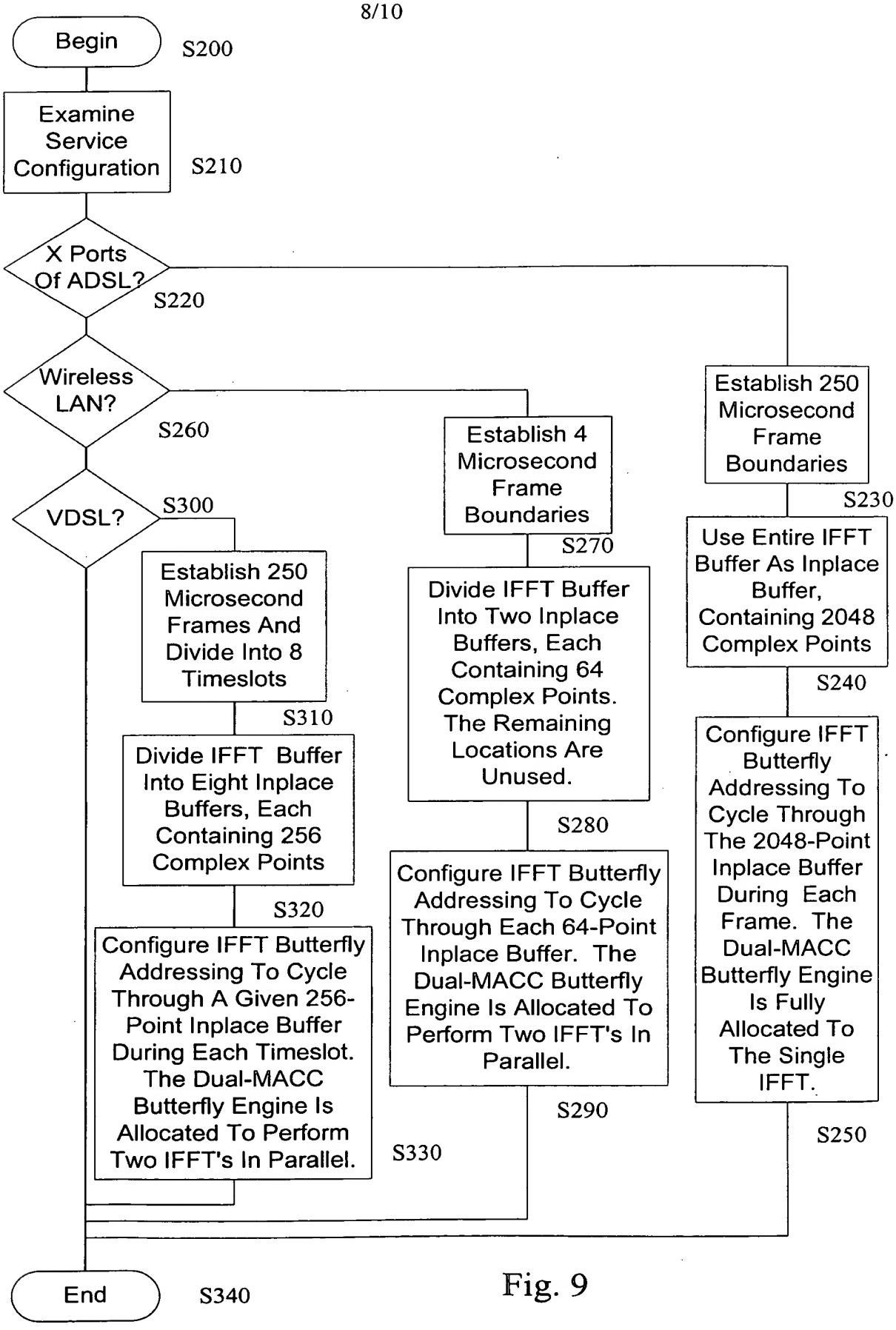
Begin
S200
Examine Service Configuration
S210
X Ports Of ADSL?
S220
Wireless LAN?
S260
VDSL?
S300
Establish 250 Microsecond Frames And Divide Into 8 Timeslots
S310
Divide IFFT Buffer Into Eight Inplace Buffers, Each Containing 256 Complex Points
S320
Configure IFFT Butterfly Addressing To Cycle Through A Given 256-Point Inplace Buffer During Each Timeslot. The Dual-MACC Butterfly Engine Is Allocated To Perform Two IFFT's In Parallel.
S330
Establish 4 Microsecond Frame Boundaries
S270
Divide IFFT Buffer Into Two Inplace Buffers, Each Containing 64 Complex Points. The Remaining Locations Are Unused.
S280
Configure IFFT Butterfly Addressing To Cycle Through Each 64-Point Inplace Buffer. The Dual-MACC Butterfly Engine Is Allocated To Perform Two IFFT's In Parallel.
S290
Establish 250 Microsecond Frame Boundaries
S230
Use Entire IFFT Buffer As Inplace Buffer, Containing 2048 Complex Points
S240
Configure IFFT Butterfly Addressing To Cycle Through The 2048-Point Inplace Buffer During Each Frame. The Dual-MACC Butterfly Engine Is Fully Allocated To The Single IFFT.
S250
End
S340

Fig. 9

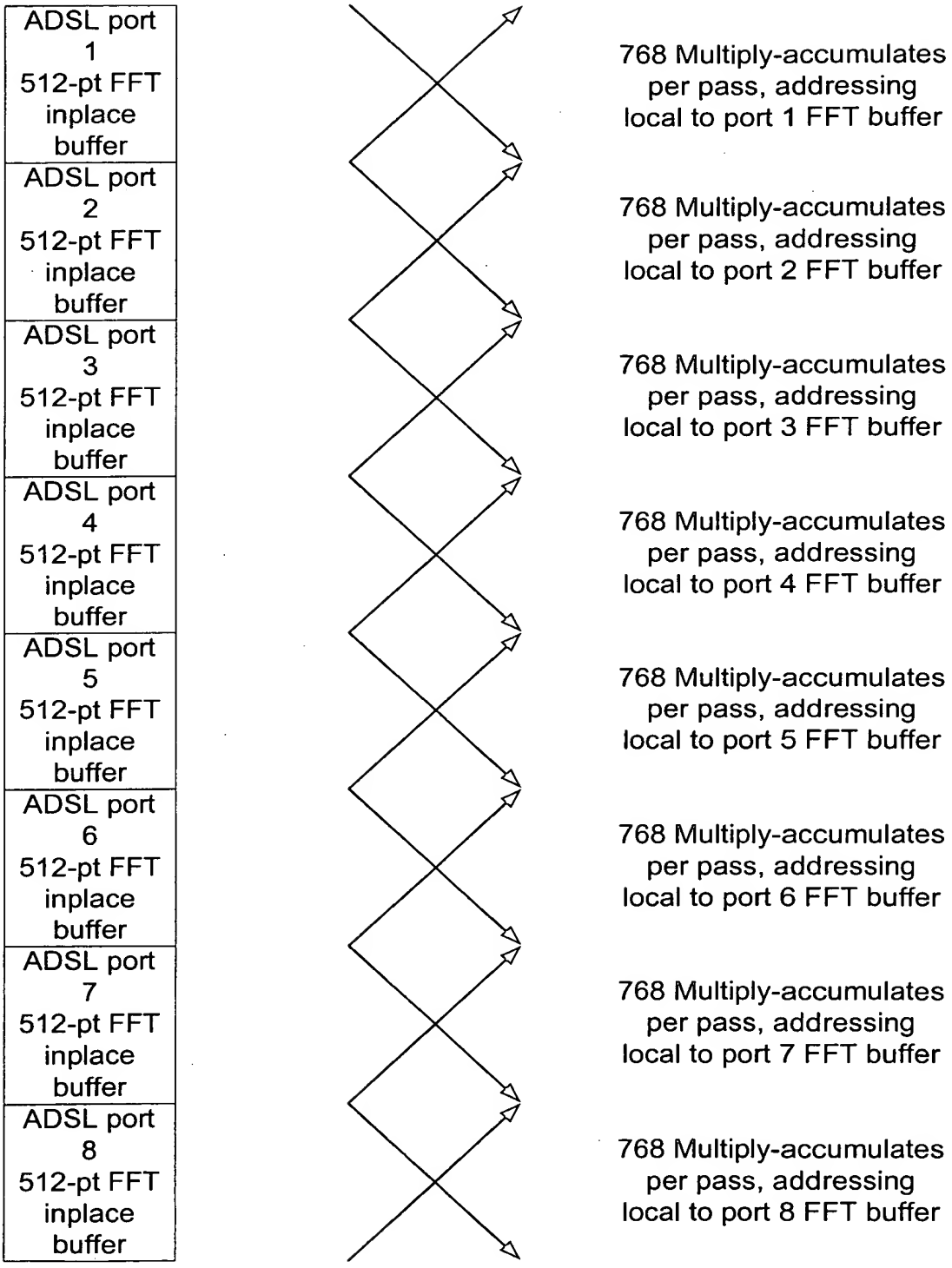
ADSL port 1 512-pt FFT inplace buffer
ADSL port 2 512-pt FFT inplace buffer
ADSL port 3 512-pt FFT inplace buffer
ADSL port 4 512-pt FFT inplace buffer
ADSL port 5 512-pt FFT inplace buffer
ADSL port 6 512-pt FFT inplace buffer
ADSL port 7 512-pt FFT inplace buffer
ADSL port 8 512-pt FFT inplace buffer
768 Multiply-accumulates per pass, addressing local to port 1 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 2 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 3 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 4 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 5 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 6 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 7 FFT buffer
768 Multiply-accumulates per pass, addressing local to port 8 FFT buffer

Fig. 10

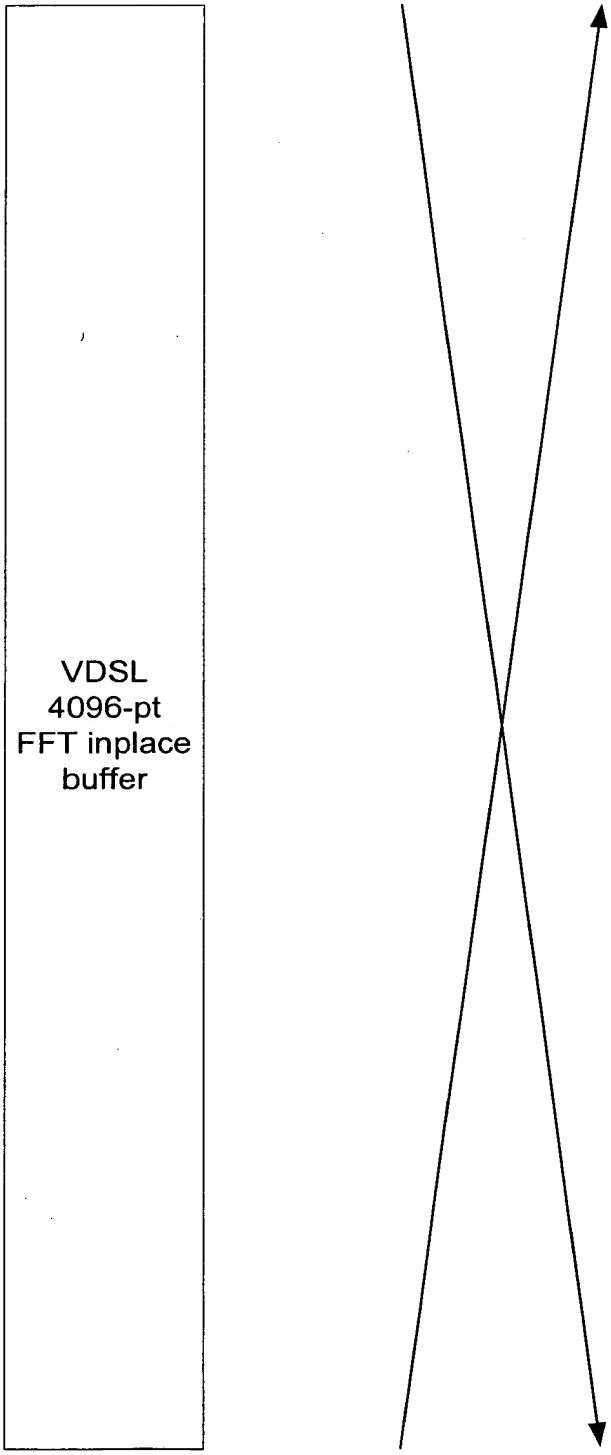
VDSL
4096-pt
FFT inplace
buffer
6144 Multiply-
accumulates per pass,
addressing throughout
4096-point FFT buffer

Fig. 11